

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum)

P15782PC/CA

J1011 U.S. PTO
10/040366
01/09/02

Box No. I TITLE OF INVENTION METHOD FOR ELIMINATING DETRIMENTAL SUBSTANCES IN A PROCESS LIQUID	
Box No. II APPLICANT	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) SCA GRAPHIC RESEARCH AB Box 3054 S-850 03 SUNDSVALL Sweden	<input type="checkbox"/> This person is also inventor. Telephone No. Facsimile No. Teleprinter No.
State (i.e. country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.) KARLSSON, Anette Rubinvägen S- 852 39 SUNDSVALL Sweden	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) GÖTEBORGS PATENTBYRÅ DAHLS AB Sjöporten 4 S-417 64 GÖTEBORG Sweden	Telephone No. +46-31-507700 Facsimile No. +46-31-7790640 Teleprinter No.
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

If none of the following sub-boxes is used, this sheet is not to be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is. country) of residence if no State of residence is indicated below.)

HAIAS, Liviu
Skönsbergsvägen 25B
S-856 45 SUNDSVALL
Sweden

This person is:

- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is. country) of nationality: SE

State (that is. country) of residence: SE

This person is applicant for the purposes of:

- ☐ all designated States
- ☐ all designated States except the United States of America
- ☒ the United States of America only
- ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is. country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is. country) of nationality:

State (that is. country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States
- ☐ all designated States except the United States of America
- ☐ the United States of America only
- ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is. country) of residence if no State of residence is indicated below.)

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- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only (if this check-box is marked, do not fill in below.)

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State (that is. country) of residence:

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- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only (if this check-box is marked, do not fill in below.)

State (that is. country) of nationality:

State (that is. country) of residence:

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- ☐ all designated States
- ☐ all designated States except the United States of America
- ☐ the United States of America only
- ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes: at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakstan, MD Republic of Moldova RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired specify on dotted line)

- | | |
|---|---|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AG Antigua and Barbuda | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AT Austria and utility model | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AU Australia and pretty patent | <input checked="" type="checkbox"/> MA Morocco |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MZ Mozambique |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CR Costa Rica | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CZ Czech Republic and utility model | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DE Germany and utility model | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DK Denmark and utility model | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> DM Dominica | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> DZ Algeria | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> EE Estonia and utility model | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> ES Spain and utility model | <input checked="" type="checkbox"/> SK Slovakia and utility model |
| <input checked="" type="checkbox"/> FI Finland and utility model | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> US United States of America and continuation-in-part |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> JP Japan and utility model | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea and utility model | |
| <input checked="" type="checkbox"/> KZ Kazakstan | |
| <input checked="" type="checkbox"/> LC Saint Lucia | |
| <input checked="" type="checkbox"/> LK Sri Lanka | |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

☐ _____

☐ _____

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 09.07.1999	9902636-1	Sweden		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): SE 9902636-1

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):	Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):
ISA / SE	Date (day/month/year) Number Country (or regional Office) 09.07.199 SE 99/01003 Sweden

Box No. VIII CHECK LIST; LANGUAGE OF FILING.

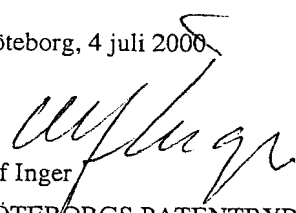
This international application contains the following number of sheets: request : 4 description (excluding sequencelisting part) : 14 claims : 4 abstract : 1 drawings : sequence listing part of description : Total number of sheets : 23	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): ITS-Report
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Figure of the drawings which should accompany the abstract:	Language of filing of the international application: English
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Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Göteborg, 4 juli 2000



Ulf Inger
GÖTEBORGS PATENTBYRÅ DAHLS AB

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

Date of receipt of the record copy
by the International Bureau:


For International Bureau use only

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

J1011 U.S. PRO
10/040366
01/09/02

Applicant's or agent's file reference P15782PC/AK		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE00/01427	International filing date (day/month/year) 05/07/2000	Priority date (day/month/year) 09/07/1999	
International Patent Classification (IPC) or national classification and IPC D21H17/65			
Applicant SCA GRAPHIC RESEARCH AB et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input checked="" type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 23/01/2001		Date of completion of this report 10.10.2001	
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Connor, M Telephone No. +49 89 2399 8402	



I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-14 as originally filed

Claims, No.:

1-17 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/SE00/01427

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1
Inventive step (IS)	Yes: Claims	
	No: Claims	1-17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1 The present application concerns a method (claim 1) for eliminating detrimental substances in a process liquid (e.g., process water or liquor in a paper manufacturing process; cf. claim 6), wherein,
 - (a) the process liquid has:
 - (ai) a first pH;
 - (aii) detrimental substances;
 - (aiii) metal ions;
 - (aiii1) comprising hydroxide builders
 - (aiv) suspended material;
 - (b) carbon dioxide is added to the process liquid (a) such that;
 - (bi) the pH of the liquid is brought to a second pH, lower than the first one (ai);
 - (bii) the second pH is comprised between 8 and 6.5;
 - (biii) CO₂ primarily forms bicarbonate ions (HCO₃⁻);
 - (biv) metal ions primarily form metal hydroxides;
 - (c) whereafter the detrimental substances coagulate or agglomerate with the metal hydroxides and;
 - (d) the agglomerate (c) adheres to the suspended material.
- 2 Reference is made to the following documents cited in the search report:

D1: US-A-5830364
D2: EP-A1-0737774
D3: US-A-5139613
D4: EP-A1-0911443
D5: DE-A1-3144314
- 3 The method proposed in claim 1 of the present application cannot be considered as novel (Article 33(2) PCT) because, as illustrated in Table 1 below, Example 1 on p. 5, ll. 44-58 of D2 appears to anticipate all the features (a)-(d) called for in claim 1 of the present application (cf. point V-1, supra, for features numbering).

Table 1: features of Example 1 of D2 common to the subject matter of claim 1

Feature*	citation	p.5, line
(a)	"aqueous suspension"	46
(ai)	implicit	
(aii)	implicit: froth of deinking process (compare with p. 9, l. 27 of the present application: "detrimental substances at least comprise [...] toner")	
(aiii)	Ca ²⁺	48
(aiii1)	calcium hydroxide	48
(aiv)	"dry solid content of 1.3% by weight"	46
(b)	"carbon dioxide containing gas"	48
(bi)	"the pH fell to..."	53
(bii)	pH = 7.0	54
(biii)-(biv)	not explicitly disclosed, but all conditions appear to be similar to the ones of the present application => implicit (the applicant is invited to address this point)	
(c)	"an aggregated crystalline precipitate was formed"	54
(d)	"carbonation of the mixture of the froth product and the calcium hydroxide"	55-56

* for feature reference numbering, see point V-1 supra

Table 1 of D2 (p. 6) lists the amount of certain components in the solid material in suspension analysed after filtration, before and after treatment with CO₂. It can be seen that as sought in the present application, many components were separated from the process liquid and the solids brightness increased after treatment.

4 D1, D3-D5 are considered as less relevant.

4.1 D1 discloses a method for recovery of a particulate material in suspension by treating it with an alkaline earth metal carbonate thereby forming a mixed aggregated solid particulate comprising the crystals and the fines. This can be done by adding to the suspension calcium hydroxide and CO₂ gas (cf. D1, col. 7, ll. 30 and 59). The method disclosed in D1 differs from the subject matter of claim 1 of the present application in that there is no detrimental substances to be co-precipitated with the metal ions and the fines in suspension. There is no suggestion in D1 that undesired substances might be thus eliminated from the process liquid.

- 4.2 D3-D5 all disclose processes comprising the addition of CO₂ to a process liquid, but none addresses the elimination of undesired substances.
- 5 Dependent claims 2-17 do not contain any features which, in combination with the features of any claim to which they refer, appear to meet the requirements of the PCT in respect of inventive step.

Re Item VII

Certain defects in the international application

- 1 It is not clear how much CO₂ was added to the samples which results are listed in Tables 1 and 2 (A&B). Is it 5.1 kg CO₂ per ton dry pulp fibres?
- 2 According to the requirements of Rule 11.13(m) PCT the same feature shall be denoted by the same reference sign throughout the application. This requirement is not met in view of the use of "CO2" and "REF" used indifferently in Examples 1 and 2 to refer to the samples presented therein. Numbering should be amended, e.g., the samples of Example 1 could be referred to as "CO1" and "REF1" and those of Example 2 to "CO2" and "REF2". This amendment would be considered to meet the requirements of Article 34(2)(b) PCT as it does not add subject matter to, but simply clarify the description.
- 3 Line 25 of p. 13 should read "Table 2B" instead of "Table 1B."
- 4 It would seem that the second embodiment on pp. 8-9 of the present application does not fall within the scope of claim 1, since dissolved calcium ions —which is a metal ion (aiii) and seems to correspond here to the detrimental substances (aii) referred to in claim 1— are precipitated in the form of calcium carbonate (CaCO₃) following addition of CO₂. In claim 1, however, feature (biv) and (c) specify that the "metal ions primarily form metal hydroxides, whereafter the detrimental substances coagulate [...] with the metal hydroxides." Since the Ca²⁺ —metal ions — form a carbonate and not a hydroxide, this second embodiment does not seem to describe the claimed invention.